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Mississippi State UNIVERSITY

Center for Air Sea Technology

USERS MANUAL

for the

MOODS

DATA

MANAGEMENT

SYSTEM

(MDMS) Version 1.0

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Stennis Space Center, MS 39529-6000

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SOFTWARE USER'S MANUAL
FOR THE
MASTER OCEANOGRAPHIC OBSERVATION
DATA SET (MOODS)
DATA MANAGEMENT SYSTEM

MDMS Version 1.0 (30 June 1994)

CONTRACT NO: NAS 13-330, Order No. 53

Prepared for:

NAVAL OCEANOGRAPHIC OFFICE
STENNIS SPACE CENTER, MS 39529

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MOODS DATA MANAGEMENT SYSTEM USER'S MANUAL

1 SCOPE

1.1 Identification

Computer Software Configuration Item (CSCI): Master Oceanographic Observation Data Set (MOODS) Data Management System (MDMS).

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1.2 Overview

The MOODS Data Management System (MDMS) provides access to the Master Oceanographic Observation Data Set (MOODS) which is maintained by the Naval Oceanographic Office (NAVOCEANO). The MDMS incorporates database technology in providing seamless access to parameter (temperature, salinity, sound speed) vs. depth observational profile data. The MDMS is an interactive software application with a graphical user interface (GUI) that supports user control of MDMS functional capabilities.

1.2.1 Logical Data Overview

The MDMS operates exclusively on parameter vs. depth observational profiles. These observations consist of a sequential series of depths, accompanied by parameter values measured at those depths. As many as three parameters may be given for the indicated depths in a sequence. Each profile is preceded by a header section that provides location, time, and other useful information for classifying the observation. This header information is traditionally referred to as "metadata" and serves to establish the criteria which may be applied in searching and querying the database or retrieving profiles from the database that conform to specific constraints.

1.2.2 Functionality Overview

The MDMS supports user defined database queries and searches of the MOODS database. The MDMS also allows profile data to be imported from external files for ingestion into the MOODS database. Conversely, profile data resident in the database may be retrieved and written to external files. Finally, the MDMS provides a limited suite of database query and data visualization tools.

1.2.3 Administrative Overview

MDMS access control is based upon a hierarchy of classification criteria. The MOODS database exists as two distinct databases, each in its own control environment with separate installations of the MDMS. The unclassified MOODS database contains both public domain and restricted data. The classified database contains classified data. The level of access granted to each user is controlled and configured by the MOODS Database Administrator (MDBA). Questions regarding access to the MDMS should be addressed to the MDBA.

1.2.4 Support Overview

This manual represents the core document for user support of the MDMS. System specifications are described in the MDMS Design Document. In addition to this manual, refer to documentation for proprietary (commercial) software and non-developed (government provided) software (NDS) which are integrated into the MDMS. These integrated software items are described in Appendix E of this manual.

1.3 Document Overview

This is the final MDMS user's manual, replacing the preliminary document provided for sponsor review. It incorporates modifications made prior to the final release of the MDMS, version 1.0.

1.3.1 References

Documents referenced within this manual are listed in Section 2. Where referenced in the text, the document name is followed by the appropriate subparagraph number of Section 2, where complete reference information may be found. Within Section 2, each reference is followed by a parenthetical listing of paragraph numbers within the manual where the reference is cited.

1.3.2 Format and Content

The format and content of this manual are in accordance with Data Item Description (DID) number DI-MCCR-80019A of the Department of Defense (DoD) Standard 2167A "Defense System Software Development" (2.1).

1.3.3 Definitions and Conventions

In order to simplify and standardize communication of procedural details to the user, this manual incorporates the following definitions and conventions:

Definitions:

- button** - When used in relation to the mouse device, a button is one of three pressure switches which may be pressed (clicked) to control some feature of the screen display. When used in relation to the monitor display, a button is a labeled area of the on-screen graphical design which resembles a switch which can be activated by pressure.
- click** - The act of pressing a button on the mouse. The term "click on", or simply "click", is frequently used to indicate that the user should maneuver the mouse cursor to a specified location on the screen (usually an area designed to resemble a button) and press (click) the appropriate button on the mouse.
- cursor** - A graphical symbol that identifies a position on a computer monitor screen. A cursor is sometimes controlled by moving a mouse device; otherwise, it is controlled from the keyboard, usually with the arrow keys.
- display** - Synonymous with the computer monitor screen; also, to demonstrate or to show.
- drag** - The act of pressing and holding a button on the mouse device and moving the mouse to control cursor movement on the monitor screen. The purpose of dragging the mouse device is to define an area on the screen or to move a graphical object to another location on the screen.
- listbox** - An outlined area of the display which contains two or more rows of textual information. Selection of text within a row is accomplished by placing the mouse cursor over the row and clicking an appropriate button on the mouse.
- mouse** - A hand controllable device used to interact with images displayed on the computer monitor screen. When a mouse is moved, a cursor on the screen moves in the same direction as the mouse. One or more buttons may be present on a mouse for invoking an action on screen at the corresponding cursor position.
- rubber band** - The act of dragging the mouse to define an area on the screen. A mouse button is pressed and held while the mouse is maneuvered to position the on-screen cursor at a desired final position; then, the mouse button is released.
- screen** - The display surface of a computer video monitor where images appear in response to bombardment by electrons.
- scrollbar** - The graphical image of a narrow bar with arrows embedded at both ends and, sometimes, a movable (sliding) button between them. The scroll bar is used to position a portion of an image or text for viewing inside a bound area that is smaller than the whole image or text. Scrolling is accomplished by placing the mouse cursor on one of the arrows and pressing the mouse button. Scrolling may also be accomplished by placing the mouse cursor over the sliding button and dragging the sliding button to a new position along the scrollbar.
- textbox** - an outlined area of the display which contains textual information. Text in a textbox may sometimes be edited; however, the usual purpose of a textbox is to provide information to the user. A textbox is not scrollable.

window - An outlined area of the screen whose contents are confined to the outlined boundary and controlled by user interaction (with buttons, menus, etc.). A window is usually a top level structure closely tied to the operating environment of the computer.

NOTE: Additional definitions are contained in Appendix A.

Keyboard Entry: Text printed in *italics* in this manual represents information which is to be entered via the keyboard as written (usually followed by pressing the enter or return key).

Mouse Button Convention: Most "click" or "select" operations with the mouse use the left button. Unless otherwise specified, instructions to "click" or "select" refer to the left mouse button. When a "click" or "select" operation using the middle or right mouse button is required, the specific mouse button will be indicated in the text; otherwise, the left mouse button should be assumed.

2 REFERENCED DOCUMENTS

This user's manual either 1) contains references to the following documents, or 2) summarizes information contained in them which is appropriate for further reading:

- 2.1. DoD Standard 2167A (DOD-STD-2167A) "Defense System Software Development" of 29 February 1988, AMSC No. N4327, Department of Defense, Washington, DC 20301. (1.3)
- 2.2. Young, Douglas A., "The X Windows System Programming and Applications with Xt, OSF/Motif Edition", Prentice Hall, Englewood Cliffs, NJ, 1990.
- 2.3. Jurkevics, Andrew, "Database Design Document for the Naval Environmental Operational Nowcast System, Version 3.5", Naval Oceanographic and Atmospheric Research Laboratory, Monterey, CA, 1 June 1992.
- 2.4. Documentation (Series) for the Empress Relational Database Management System, Version 6.X, Vol. A1-D1, Empress Software Incorporated, Greenbelt, MD, 1993.
- 2.5. Users Manual and Reference Guides for UNIRAS ag/X Toolmaster Graphics Extensions Library, Version 6v3b, UNIRAS, Incorporated, Overland Park, KS, 1993.
- 2.6. Coffin, Stephen, "UNIX System V Release 4: the Complete Reference", Osborne McGraw-Hill, New York, NY, 1990.

3 EXECUTION PROCEDURES

3.1 Initialization (Launching the Application)

The MDMS observes the standard procedure for executing an application in the X-Windows environment. At the X-Windows command line prompt, enter *moods* [-f] [filename] or *moods. -f filename* is optional; the -f flag indicates that the next parameter is the name of an initialization (configuration) file. If only *moods* is entered, the MDMS will look

for the "moods.defaults" file in the current directory. The MDMS main display will appear after initial window manager procedures are completed (e.g., If using "toms window manager" - ".twmrc", a window skeleton appears on screen which must be maneuvered to the desired position on the monitor screen with the mouse. If using "motif window manager" - ".mwmrc", the position of the main display is predefined and appears without any further action after entering *moods* from the keyboard. Other window managers may involve different procedures before the main display appears.).

3.2 Initialization Files

Initialization files contain default settings for maximum and minimum values of the key search/query/retrieval parameters required by the MDMS. Instructions for creating initialization files are provided in Appendix C. Questions regarding implementation of initialization files should be directed to the MDBA. If an initialization file cannot be found, (1) textbox displays within the "Selection Status" area of the main MDMS display will be blank (no initial values), (2) the message "Error Reading Defaults File" will be displayed in the "REMARK:" textbox at the bottom of the main SCDMS display window, and (3) the SCDMS will use global default values resident in the application.

3.3 Description of Display Windows

The screen displays of the MDMS are X-Windows clients. Window control adheres to standard X-Windows procedures. As illustrated in Figure 1, the opening display is subdivided into five major areas: (1) title area; (2) "Data Selection" area; (3) "Selection Status" area; (4) pull-down menu bar; and (5) the "REMARKS" area. The functionality and purpose of each area of the display is described below and illustrated in Figure 1.

3.3.1 Title Area

The title area, which occupies the top fifth (approximately) of the display, has no purpose except to identify the application as the "NAVAL OCEANOGRAPHIC OFFICE MOODS DATA MANAGEMENT SYSTEM".

3.3.2 Data Selection Area

The "Data Selection" area of the main display window occupies most of the left half of the display. It contains 7 smaller, labeled areas for setting the maximum or minimum values of configuration parameters displayed in the "Selection Status" area occupying the right half of the display. Parameter ranges are effective during searches, queries and retrievals of data from the MOODS database. To set a parameter value within the "Selection Status" area, you must select (or enter) that parameter using the interfaces provided within the "Data Selection" area.

3.3.2.1 Data Selection Area: Classification (Listbox)

This scrollable listbox contains NAVOCEANO MOODS classification codes. These codes may be selected **one at a time** by clicking on (selecting) the line containing the desired code. Classification codes are multi-digit positive integers that control and restrict access to the MOODS database. Classification codes can **only** be changed by the MDBA. Each line in the "Classification" listbox contains a unique code followed by textual information describing that code. If the number of valid codes exceeds 5, the scrollbar at the right will be activated. When

selected, a classification code is copied into the "Selection Status" area of the main display window as a maximum or minimum value adjacent to the label "Classification".

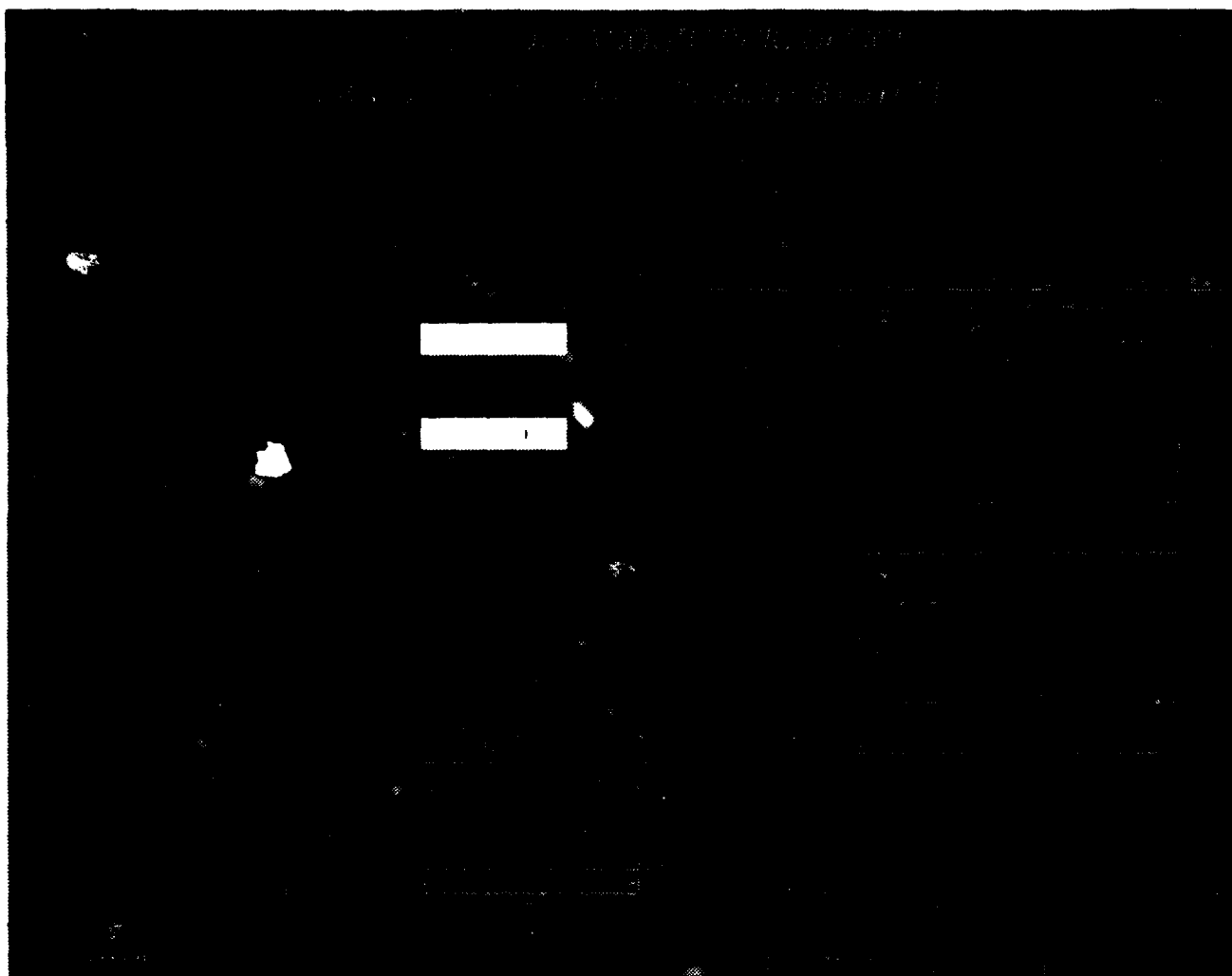


Figure 1. MOODS Data Management System (MDMS) Opening Display Screen.

3.3.2.2 Data Selection Area: Instrument Type (Listbox)

The "Instrument Type" listbox contains a variety of instruments known to be employed in the collection of observational data. Instrument types are positive integer codes starting with 0 (unknown) and can only be selected one-at-a-time. Only the MDBA can modify instrument types. If the number of valid instrument types exceeds 5, the scrollbar to the right will be activated. When selected, an instrument type is copied into the "Selection Status" area of the main display window as a maximum or minimum value adjacent to the label "Instrument Type".

3.3.2.3 Data Selection Area: Load Date (Textbox)

The "Load Date" textbox allows entry of the date when data was ingested into the MOODS database. The user must enter the date of loading in a continuous year, month, day (YYYYMMDD) format; e.g., 19920616 is 16 June 1992. This entry will be copied into the "Selection Status" area of the main display window, as a maximum or minimum value, adjacent to the label "Loading Date". To enter a load date, click the "Load Date" textbox and enter the date string from the keyboard. Text entered into the "Load Date" textbox may be edited by dragging the cursor to highlight selected characters and replacing them using the keyboard.

3.3.2.4 Data Selection Area: Number of Parameters (Scrollbar)

The "Number of Parameters" is set via a small horizontal scrollbar scale ranging from 2 (left boundary) to 4 (right boundary) which allows the user to specify the number of primary profile parameters (depth, temperature, salinity, sound speed) involved in database retrievals, searches and queries. The "Number of Parameters" selection is reflected in the "Selection Status" area under "Parameters". The scrollbar is moved by dragging with the mouse. Depth is always selected as a primary parameter; hence, the minimum number of parameters is two. The number of parameters is correlated with the MOODS profile structure in the following manner:

<u>Number</u>	<u>Parameters</u>
2	depth and temperature
3	depth, temperature and salinity
4	depth, temperature, salinity and sound speed

3.3.2.5 Data Selection Area: Source Code (Listbox)

This listbox displays numerical codes and accompanying information about the sources of data contained in the MOODS database. Source identification codes are positive integers. Only one source code can be selected at a time. Source codes are copied into the "Selection Status" area under "Source Code". If more than 5 source codes are defined, the "Source Code" listbox becomes a scrollable list. Source codes can only be changed by the MDBA.

3.3.2.6 Data Selection Area: Cruise Id (Textbox)

The "Cruise Id" textbox allows the user to enter a cruise identification number which is automatically copied into the "Selection Status" area, as a maximum or minimum value, adjacent to the label "Cruise Id". To enter a cruise identification number, click the "Cruise Id" textbox and enter the number from the keyboard. Text entered into the "Cruise Id" textbox may be edited by dragging to highlight selected characters and replacement them using the keyboard.

3.3.2.7 Data Selection Area: Month (Listbox)

The "Month" scrollable listbox displays the twelve months of the year. The month selected will be the lower (minimum) or upper (maximum) boundary of the desired range of months within the year. The month selected from the "Month" listbox is copied into the "Selection Status" area under "Month" as a maximum or minimum value.

3.3.3 Selection Status Area

The "Selection Status" area contains a matrix of textboxes which displays minimum (leftmost column) and maximum (rightmost column) values for each labeled criteria (row). The two top rows ("Latitude" and "Longitude") are set by selecting "Region" from the "SELECT" pull-down menu (see subpara. 3.3.4.1.1). The third row ("Time") values are set by selecting "Time" from the "SELECT" pull-down menu (see subpara. 3.3.4.1.2). The remaining rows of minimum and maximum values are set from within the "Data Selection" area, accessing each labeled criteria once to modify the minimum value (leftmost column) and once to modify the maximum value (rightmost column). "Selection Status" textboxes cannot be edited. **Each textbox in the "Selection Status" area must contain a value; otherwise, the MDMS will not initiate a search of the MOODS database.**

3.3.3.1 Selection Status Area: Default Values

When launched, minimum and maximum parameter values displayed in "Selection Status" textboxes are obtained by reading an initialization file containing default values. Unless the initialization filename (and path) is included in the command line following the "-f" flag, the MDMS will look for a file named "moods.defaults" in the current directory. Users and/or the MDBA may tailor their own initialization files (see Appendix C for an example and instructions on creating user initialization files). If an initialization file cannot be found, "Selection Status" textboxes will not be initialized with entries at startup.

3.3.3.2 Selection Status Area: Minimum and Maximum Toggles

Each column within the "Selection Status" area is headed by a toggle button - "Minimum" above the leftmost column, and "Maximum" above the rightmost column. Each button may be alternately toggled (activated and deactivated) by successive clicks. When activated, these buttons are red; when inactive, they are displayed in a shade of the background color. When the "Minimum" toggle is active (red), all modifications performed in the "Data Selection" area affect the "Minimum" column. The "Maximum" toggle button evokes the same behavior in the "Maximum" column. If no toggle button is active, any selections from the "Data Selection" area will default to the "Minimum" column.

3.3.3.3 Selection Status Area: Latitude and Longitude Values

In the "Selection Status" area, a south latitude or a west longitude are given as negative values. North latitude and east longitude are displayed as positive values (plus sign understood). Values for latitude and longitude are expressed in decimal degrees; e.g., 37 degrees, 43 minutes is displayed as 37.716666 (degrees). The 6-decimal accuracy offers precision in increments of 0.364567 feet (4.3748 inches), or to the nearest millionth of an arc degree (0.00006 nautical mile). Latitude and longitude values may be set by reading default values from an initialization file or by using the "Region" option available from the "Select" pulldown menu.

3.3.3.4 Selection Status Area: Time

Maximum and minimum times are expressed as YYYYMMDD:HH:mm:ss, where YYYY is the year (four digits), MM is month (1-12), DD is day of the month, HH is the whole hour (00 through 23), mm is the minute, and SS is the second. This format is consistent with the format used for "Load Date" with the addition of hour/minute/second time resolution. Time values may

be set by reading default values from an initialization file or by using the "Time" option available from the "Select" pull-down menu.

3.3.3.5 Selection Status Area: Loading Date

Maximum and minimum loading dates are expressed as YYYYMMDD, where YYYY is the year (four digits), MM is month (1-12), and DD is day of the month. The "Loading Date" format is consistent with the format used for "Time". "Load Date" values may be set by reading default values from an initialization file or by using the "Load Date" textbox within the "Data Selection" area.

3.3.4 Menu Bar

The pull-down menus are accessed by clicking the labeled menu header buttons in the menu bar. Subordinate menu items are then displayed as additional labeled buttons below the top-level (header) button. The user may select a menu-item by clicking. When a pull-down menu item is selected, a window will usually open to reveal pertinent options. When pull-down menu items are visible, they may be closed by clicking in a neutral area of the MDMS display window or by clicking another menu header button.

3.3.4.1 SELECT (Menu Header)

The "SELECT" pull-down menu button is the leftmost button in the menu bar. "SELECT" offers options for defining regional boundaries ("Region"), time constraints ("Time") and to "Exit" from the MDMS.

3.3.4.1.1 SELECT: Region

Clicking the "Region" button opens a "REGION SELECTION" window which permits definition of geographic region boundaries. The "REGION SELECTION" window is illustrated in Figure 2. Information defined within this window is copied into the "Latitude" and "Longitude" textboxes within the "Selection Status" portion of the main display. The "REGION SELECTION" window supports three methods of defining latitude/longitude boundaries:

(1) **Predefined Region:** Select a predefined region by clicking on a named region in the scrollable "REGION LIST" listbox. The named region will then be displayed for inspection as a dashed rectangular boundary in the map display in the right of the window. **Predefined regions can only be modified, added, or deleted by the MDBA.**

(2) **Keyboard Entry:** Define a region by selecting "REGION COORDINATES" textboxes and entering (via the keyboard) latitude/longitude coordinates of the **northeast** and **southwest** corners of a geographic region. Note that latitude and longitude entries in "REGION COORDINATES" textboxes are given in N, E, S, W notation; whereas, in the "Selection Status" area of the main MDMS display south latitude or west longitude are displayed as **negative** values and north latitude or east longitudes are displayed as **positive** values (plus sign understood).

(3) **Rubber Band:** Define a region by dragging the mouse cursor from an initial position on the map display to a final position. The defined region appears on the map display as a rectangular area bounded by dashed lines. When the cursor lies within the map display boundary, its position is displayed as latitude/longitude coordinates in the "LAT:" and "LON:" textboxes located below the map display. Vertical and horizontal scrollbars allow positioning of the map display. When

clicked, the "Zoom" button located below the map display opens a window which displays an enlarged view of the defined region. The rubber band technique may be reapplied within the zoom window to refine the desired geographic area (Note: "LAT:" and "LON" textboxes below the map display do not reflect cursor coordinates within the "ZOOM" window.). The "Zoom" button will also enlarge geographic regions defined within the zoomed window. To close the zoom window, click the **right mouse button** within the zoom window boundary. The coastline depicted on the map display is composed of plotted points rather than connected lines in a design effort to optimize coastline plotting speed. At sufficiently high zoom resolution, the coastline will become ill-defined.

The pull-down "File" menu header contains options to "RESET" the region coordinates to default values as listed in the "Selection Status" area and to "Exit" the "REGION SELECTION" window. When finished with the "REGION SELECTION" window, click the "File: EXIT" pull-down menu item to close the window and update the "Latitude" and "Longitude" textboxes within the "Selection Status" area of the main MDMS display.

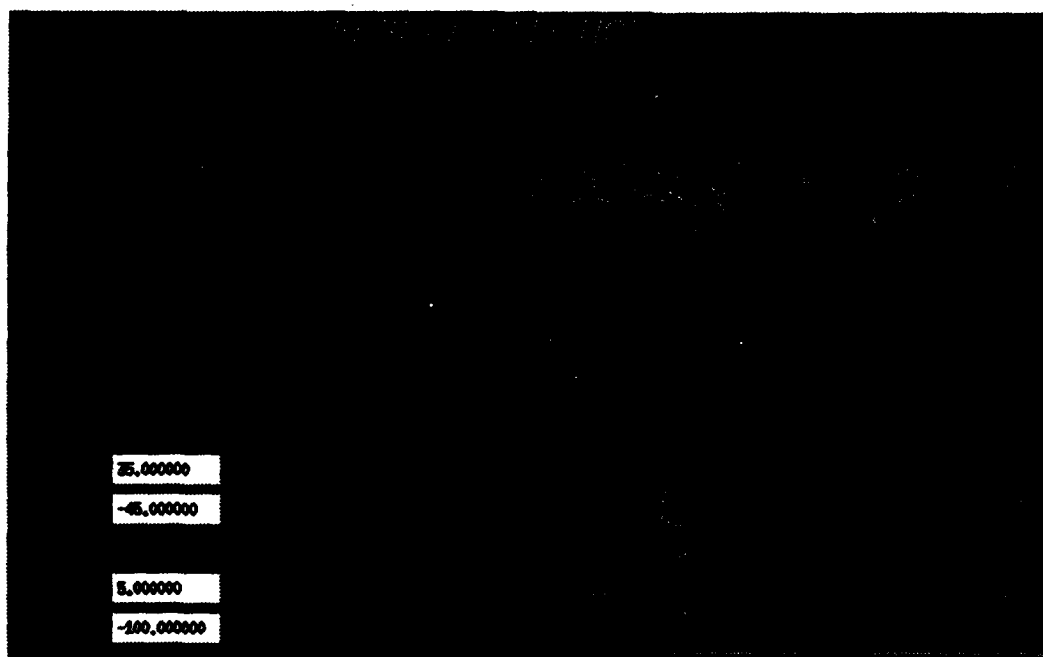


Figure 2. REGION SELECTION Window

3.3.4.1.2 SELECT: Time

When the "Time" menu-item button is clicked, a "TIME SELECTION" window opens for defining minimum and maximum date and time limits. Date and time limits defined in the "TIME SELECTION" window are reflected in the "Time" criteria row within the "Selection Status" section of the main display. The "TIME SELECTION" window is illustrated in Figure 3.

Entering Date/Time Information: The "TIME SELECTION" window allows setting of "START" (minimum) and "END" (maximum) dates and times for database search/query/retrieval operations. Clicking on the diamond-shaped "RESET" button places default

date/time components in the active "START" or "END" row of date/time element textboxes. A row of date/time component textboxes is selected by clicking on the diamond-shaped button adjacent to the "START" or "END" label. When active, the "START" and "END" buttons are displayed in red, and, the button and label area is outlined by a rectangle. Textboxes in the active row ("START" or "END") may be edited from the keyboard when selected. The "HOUR", "MIN" and "SEC" textboxes display hours, minutes and seconds in "hh:mm:ss" format, where "hh" is the number of hours, "mm" is the number of minutes, and "ss" is the number of seconds. Date entries may also be changed using the up or down arrow switch buttons to the right of the "YEAR", "MONTH", "DAY", and "JULIAN" textboxes. These arrow switches are manipulated by clicking.

1982	12	7	341	6	30	0
1988	12	30	364	21	30	50

Figure 3. TIME SELECTION Window

3.3.4.1.3 SELECT: Exit

Clicking the "Exit" menu-item closes the MDMS main display screen and returns the user to the system command line prompt.

3.3.4.2 MDBA

The "MDBA" pull-down menu contains options to "Import" and "Export" data to/from the MOODS database. It also contains an "Update Table" option. The "Import" and "Update Table" options are available only to the MOODS Database Administrator (MDBA) user account.

3.3.4.2.1 MDBA: Import (MDBA Only)

Selecting the "Import" option from the "MDBA" pull-down menu has no effect unless you are the MDBA. When the "Import" menu item is selected from the "MDBA" pull-down menu, the "Input File" pop-up window (Figure 4) appears for entering the filename (with pathname, if the file is not located in the current directory). To be imported, the file must be in the MOODS ADMIN format. After entering the filename from the keyboard, click the "OK" button to import the MOODS data from the named file. If the file cannot be located, the dialog window will close

automatically and a message will be sent to the "REMARKS" textbox in the main MDMS display. Clicking the "Cancel" button closes the dialog window without importing from the named file.

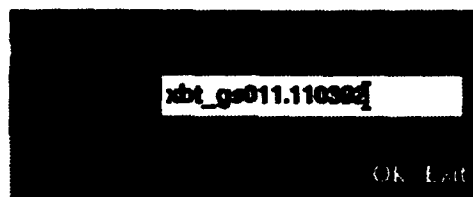


Figure 4. MDBA Filename Entry Dialog Window for Importing Files

3.3.4.2.2 MDBA: Export

When the "Export" menu item is pressed from the "MDBA" pull-down menu, two export format choices appear to the right of the pulldown menu - "Export Admin" (for MOODS Administrative Format) and "Export Ideas" (for Interactive Data Analysis System Format). A dialog window (Figure 5) appears for entering a filename after either format is selected. After entering the filename from the keyboard (including the path if the file is to be written to a directory other than the current directory), click the "OK" button to export the MOODS data to the named file. If the file cannot be written, the "Export" dialog window closes and an error message is sent to the "Remarks" section of the main MDMS display.



Figure 5. MDBA Filename Entry Dialog Windows for Exporting Data to Files (left window is for MOODS ADMIN format; right window is for IDEAS format)

3.3.4.2.3 MDBA: Update Table (MDBA Only)

Selecting options within the "Update Table" menu item from the "MDBA" pull-down menu has no effect unless you are the MDBA. When selected, the "Update Table" menu item displays three options: "update_inst", "update_source" and "update_class". These options allow the MDBA to update information listed in the "Instrument Type", "Source Code" and "Classification" listboxes in the "Data Selection" area of the main MDMS display.

3.3.4.2.3.1 MDBA: Update Table - update_inst (MDBA Only)

When selected, the "update_inst" menu item displays the "UPDATE INSTRUMENT" window. As illustrated in Figure 6, this window allows new instrument code numbers and descriptions to be added to the listing of instruments displayed in the "Instrument Type" scrollable listbox in the "Data Selection" area of the main MDMS display. Existing entries can be edited or deleted. The "Instrument Number" and Instrument Description" textboxes can be cleared and the scrollable "Instrument" listbox can be returned to its original state by clicking the "Reset" button. The "UPDATE INSTRUMENT" window can be closed by clicking the "Exit" button.

a. To add a new entry to the "Instrument Type" textbox, (1) select the "Instrument Number" textbox and enter the appropriate instrument number, (2) select the "Instrument Description" textbox and enter the appropriate descriptive information and (3) click the "Add" button.

b. To edit an existing entry in the "Instrument Type" textbox, (1) select the instrument from the listing in the scrollable "Instruments" textbox, (2) make changes to the instrument information displayed in the "Instrument Number" and "Instrument Description" textboxes using the mouse and keyboard and (3) click the "Update" button.

c. To delete an existing entry from the "Instrument Type" textbox, (1) select the Instrument to be deleted in the "Instrument" window and (2) click the "Delete" button.

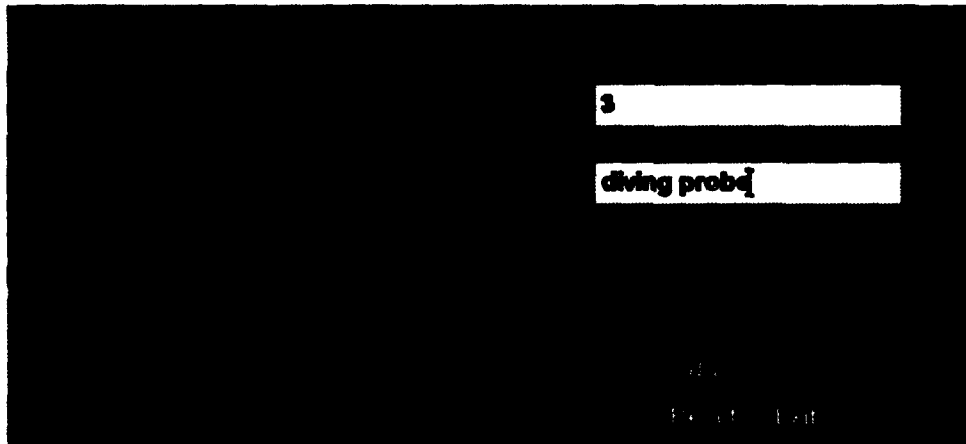


Figure 6. MDBA Update Instrument Window

3.3.4.2.3.2 MDBA:Update Table - update_source (MDBA Only)

When selected, the "update_source" menu item displays the "UPDATE SOURCE" window. As illustrated in Figure 7, this window allows new source numbers and descriptions to be added to the listing of data sources in the "Source Code" listbox of the "Data Selection" area. Existing entries can be edited or deleted. The "Source Number" and "Source Description" text entry boxes can be cleared and the "Source" scrollable listbox can be returned to its original state by clicking the "Reset" button. The "UPDATE SOURCE" window can be closed by clicking the "Exit" button.

a. To add a new entry to the "Source Code" textbox, (1) select the "Source Number" text entry box and enter the appropriate source number, (2) select the "Source Description" text entry box and enter the appropriate descriptive information and (3) click the "Add" button.

b. To edit an existing entry contained in the "Source Code" textbox, (1) select the source from the listing in the scrollable "Source" textbox, (2) make changes to the source code information displayed in the "Source Number" and "Source Description" text entry boxes and (3) click the "Update" button.

c. To **delete an existing entry** from the "Source Code" textbox, (1) select the source to be deleted from the "Source" window and (2) click the "Delete" button.

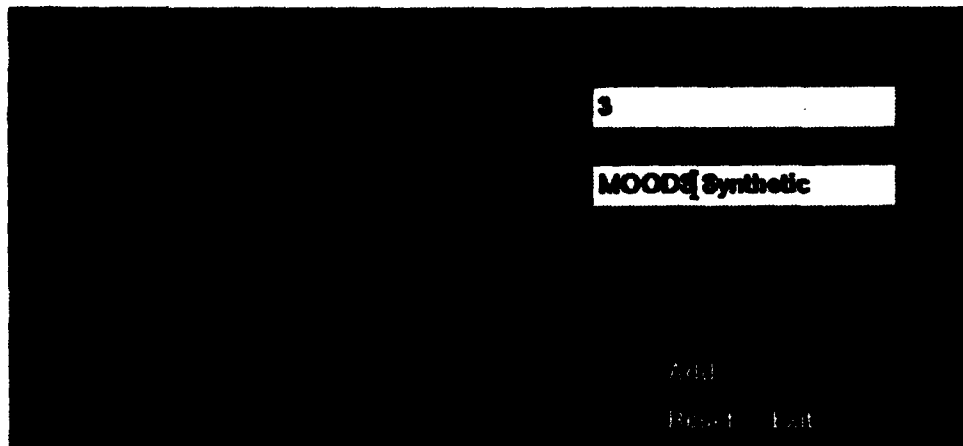


Figure 7. MDBA Update Source Window

3.3.4.2.3.3 MDBA: Update Table - update_class (MDBA Only)

When selected, the "update_class" menu item displays the "UPDATE CLASS" window. As illustrated in Figure 8, this window allows new classification number codes and descriptions to be added to the listing of classification codes displayed in the "Classification" listbox within the "Data Selection area. Existing entries can be edited or deleted. The "Class Number" and "Class Description" text entry boxes can be cleared and the "Classification" listbox can be returned to its original state by clicking the "Reset" button. The "UPDATE CLASS" window can be closed by clicking the "Exit" button.

a. To **add a new entry** to the "Classification" textbox, (1) select the "Class Number" text entry box and enter the appropriate classification number, (2) select the "Class Description" text entry box and enter the appropriate descriptive information and (3) click the "Add" button.

b. To **edit an existing entry** contained in the "Classification" textbox, (1) select the classification information line from the "Classification" textbox, (2) make changes to the classification information displayed in the "Class Number" and "Class Description" text entry boxes and (3) click the "Update" button.

c. To **delete an existing entry** from the "Classification" textbox, (1) select the classification information line from the "Classification" textbox and (2) click the "Delete" button.

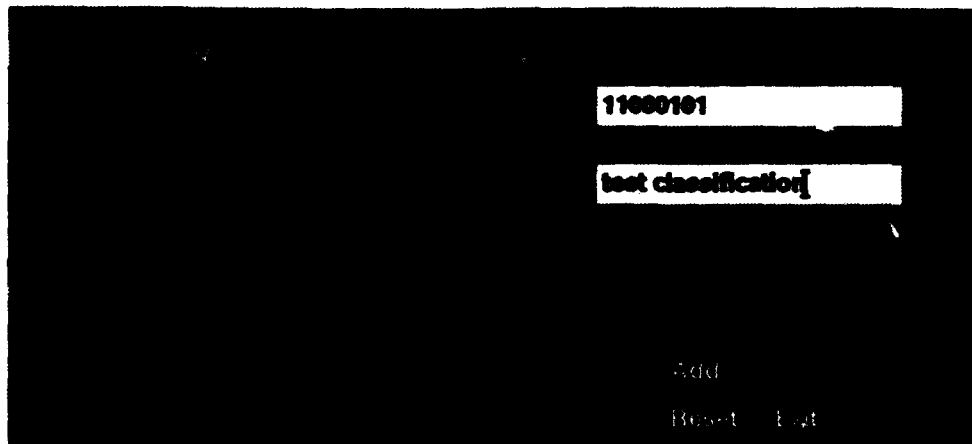


Figure 8. MDBA Update Classification Window

3.3.4.3 PRODUCTS

The "PRODUCTS" pull-down menu offers six options. The "Distribution" menu item allows the user to examine the location of individual profiles within the group of profiles found in the database search process. The "Depth Vs Parm" menu item supports plotting profile data as a function of depth. The "Temp Vs Salinity" menu item allows the user to view temperature versus salinity plot when both parameters are available. The "Print Header" menu item allows display of header information, either on the screen or as printer output. The "Print Log" menu item supports review of historical procedures activity keyed to the various functions available within the MDMS. The "Page Summary" menu item displays or prints a summary of observation distributions by year and months within the year and also the distributions by source code, instrument code and classifications.

3.3.4.3.1 PRODUCTS: Distribution

When the user clicks the "Distribution" menu item, a "Distribution Plot" definition window appears as shown in Figure 9. Distribution plots are constructed using a grid of latitude/longitude rectangles whose size (mesh distance) is determined by values entered into the "Latitude" and "Longitude" textboxes. Resolution of the coastline for geographic plots is also selectable (3, 8, or 20 kilometers) from the "Coast Line" pull-down menu (note: The textbox adjacent to the "Coast Line" menu header may be selected and edited directly from the keyboard to change coastline resolution.). The user can choose between "Screen" (default) and "Printer" output by toggling the button provided for that purpose. Profile distribution may be viewed as two types of geographical plots ("Distribution" and "Accumulation") or as a "Histogram" by clicking the appropriately labeled button. The "Pixel Size" sliding scale permits variation of the size of the plotted location point on the geographic background. "Pixel Size" has no effect on the histogram plot. When grid dimensions, coastline resolution and output features have been defined, clicking "Ok" will produce the appropriate display window. Figure 10 illustrates the "Accumulation Plot with Instrument Symbols" window which is produced after clicking the "Accumulation" button in the "Distribution Plot" window. Clicking the "Distribution" button produces a similar geographical plot without printing the count of profiles within each latitude/longitude rectangle. Figure 11 is an example of the three-dimensional "Histogram Distribution" plot produced by clicking the "Histogram" button in the "Distribution Plot" window. When finished viewing the plot, click anywhere in the plotting window to close it. To exit the "Distribution Plot" window, click the "Exit" button.

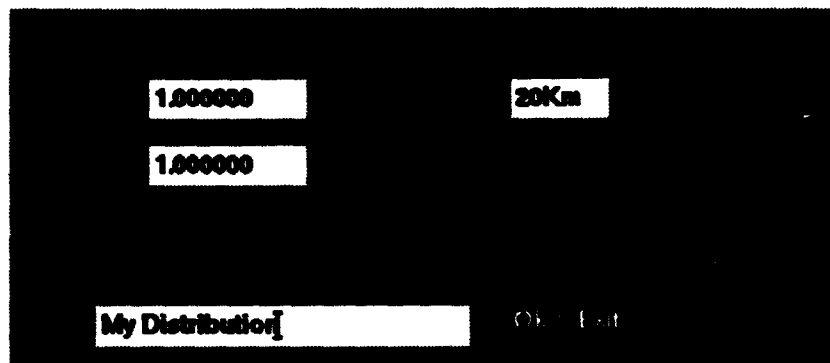


Figure 9. Distribution Plot Definition Window

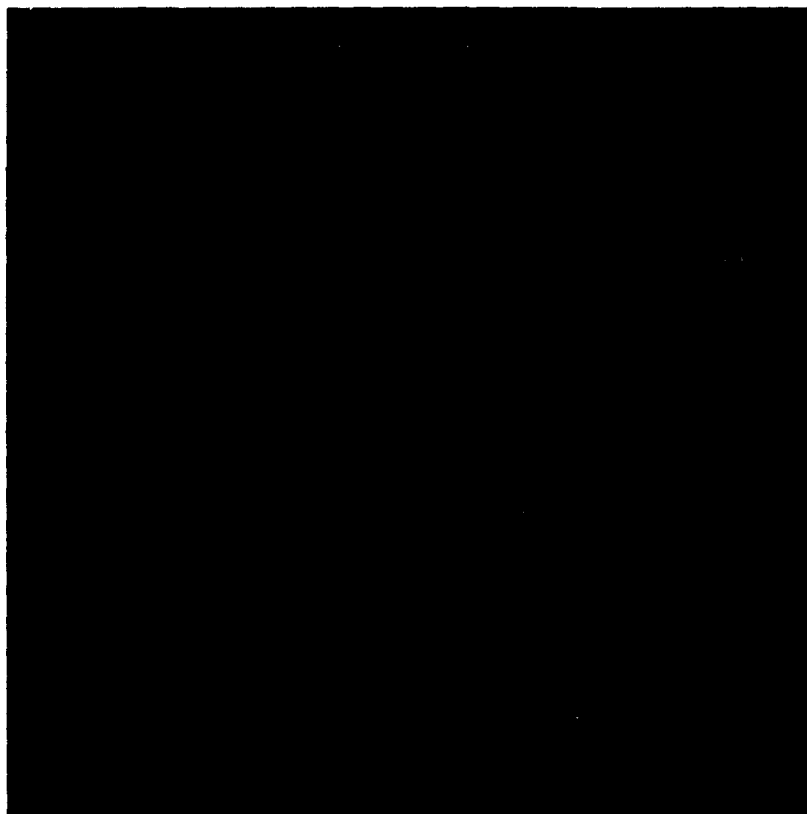


Figure 10. Profile Distribution/Accumulation Plot Window

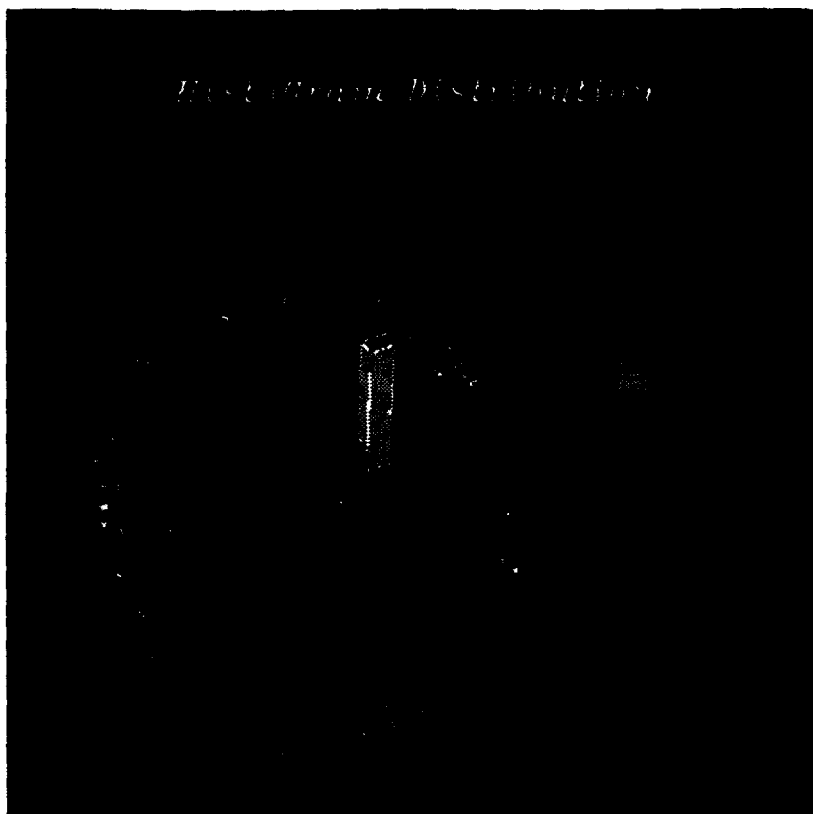


Figure 11. Histogram Plot of Profile Distribution

3.3.4.3.2 PRODUCTS: Depth Vs. Parm

When the "Depth Vs Parm" menu item is clicked, an adjacent pulldown menu appears offering a choice among three depth versus parameter plots: Depth vs. Temperature; Depth vs. Salinity; and Depth vs. Sound Speed. For each option, a depth vs. parm definition window appears. Figure 12 illustrates the depth vs. temperature window, which is labeled "Temperature" (The depth vs. salinity and depth vs. sound speed definition windows are labeled "Salinity" and "Sound Speed", respectively; otherwise, they are identical in appearance and functionality to the depth vs. temperature window). The depth vs. parameter definition window contains textboxes for entry of minimum and maximum values for the x and y axes ("XAxis Min", "XAxis Max", "YAxis Min" and "YAxis Max") and the maximum number of profiles to plot ("Max Profiles"). Once these values have been entered, you may choose to (a) plot the depth vs. parameter graph within a window (on-screen) or (b) to print the graph on a printer by toggling the "Screen/Printer" button. When your choices have been defined, click the "OK" button to produce the plot. To close the on-screen plotting window, click anywhere within its boundary. Click the "Exit" button to close the "Depth Vs Parm" window and return to the main display window. Figure 13 illustrates a depth vs. temperature plot which is similar to plots produced by the other two options (depth vs. salinity and depth vs. sound speed).

0.000000
30.000000
0.000000
5000.000000
20000

Ok Exit

Figure 12. Depth vs. Temperature Definition Window



Figure 13. Depth vs. Temperature Plot Example

3.3.4.3.3 PRODUCTS: Temperature vs Salinity

When the "Temperature vs Salinity" menu item is clicked a similar window to temp vs depth, Figure 12, appears. The temp vs. salinity definition window contains textboxes for entry of

minimum and maximum values for the x and y axes ("XAxis Min", "XAxis Max", "YAxis Max" and "YAxis Max") and the maximum number of profiles to plot ("Max Profiles"). Once these values have been entered, you may choose to (a) plot the temp vs. salinity graph within a window (on-screen) or (b) to print the graph on a printer by toggling the "Screen/Printer" button. When your choices have been defined, click the "OK" button to produce the plot. To close the on-screen plotting window, click anywhere within its boundary. Click the "Exit" button to close the "Temp Vs Salinity" window and return to the main display window. A window similar to Figure 13 displays Salinity vs. Temperature plots.

3.3.4.3.4 PRODUCTS: Print Header

The "Print Header" output selection window, Figure 14, appears when the "Print Header" menu item is selected from the "Products" pull-down menu. This window presents diamond-shaped buttons for selecting either "Screen", "Printer" or "File" as the output target. Only one option may be selected at a time. After selecting the output target, click the "Ok" button to produce a listing of profile headers on the target output device. If "Screen" is the selected option, output is directed to a text window on screen. The header display window may be closed by selecting its "Close" option from the X-Windows unlabeled pull-down menu located in the upper left corner of the window border. The text window display contains output from the UNIX "vi" editor. It responds to all "vi" commands. If "Printer" is the selected option, a paper printout of the header information is produced by the default printer. To ensure printout of full lines, the default printer should be capable of 136 character/line output. If "File" is the chosen option, the header information is written to a user specified file as defined in the dialog box that appears when the "File" option is selected. To close the "Print Header" window, click the "Exit" button.



Figure 14. Print Header Output Selection Window

3.3.4.3.5 PRODUCTS: Print Log (MDBA Only)

The "Print Log" window, Figure 15, is available to the **MDBA user account only**. It appears when the "Print Log" menu item is selected from the "Products" pull-down menu. The "Print Log" window produces a listing of historical information about actions that have been performed on the MOODS database using the MDMS. The scrollable "Functions" textbox allows you to focus on the history of specific operations and procedures; e.g., "IMPORT", "CREATE_TABLE", "DATE_CLASS". Only one function may be selected at a time. Text entry boxes permit entry of userid names and minimum and maximum dates. The default userid name is the wildcard "*" (all users) and the date defaults are 1 January of the current calendar year ("Min Date") through the current date ("Max Date"). After choosing a function and modifying "Name", "Min Date" and "Max Date" textboxes as desired, the MDBA may select among "File", "Printer" or "Screen" as the output target by clicking one of the diamond-shaped buttons adjacent to the respective labels. Once these options have been defined to the MDMS, clicking the "Ok" button executes the options. If the "File" option is selected, the historical data will be printed to the text file "moods_log.dat" in the current directory. The file "moods_log.dat" is overwritten by

subsequent output of log information to the file - it is not appended. If you have selected the "Screen" option for output, a text window (see Figure 16) will display the log data pertinent to the function, user and date range selected in the "Print Log" window. To close the text window, select "Close" from the X-Windows unlabeled pull-down menu located in the upper left corner of the window border. If you have selected "Printer" as the output target, the information will be dumped to the default printer. The status of your request via the "Print Log" window is printed in the "Message" textbox in the lower left portion of the "Print Log" window. The "Reset" button may be used to deselect any functions and return the "Name", "Min Date" and "Max Date" text windows to their original default values. When finished, click the "Done" button to return to the MDMS main display.

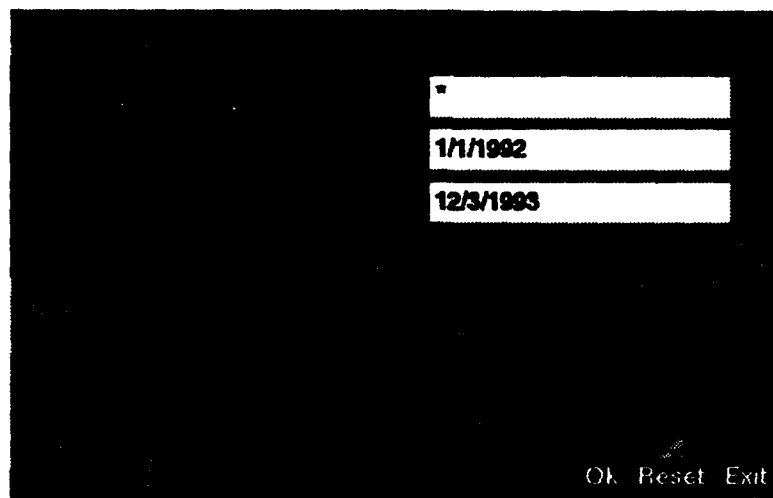


Figure 15. Print Log Definition Window

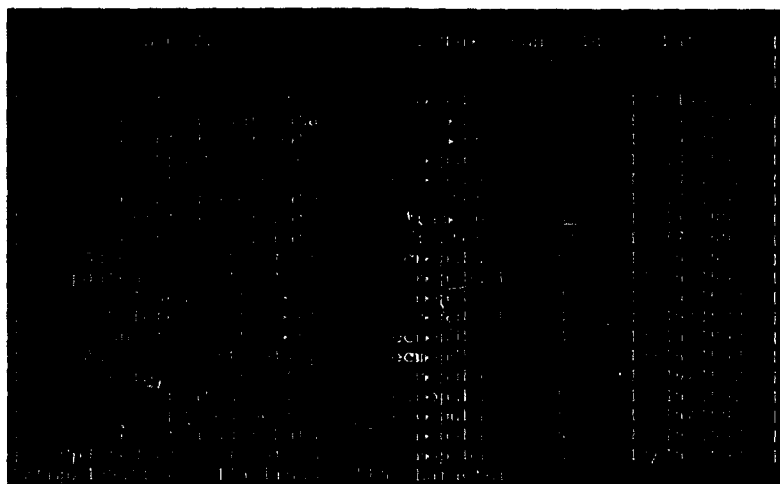


Figure 16. Print Log Screen Output Example

3.3.4.3.6 PRODUCTS: Page Summary

The "Page Summary" output selection window, Figure 17, appears when the "Page Summary" menu item is selected from the "Products" pull-down menu. This window presents diamond-shaped buttons for selecting either "Screen", "Printer" or "File" as the output target. Only one option may be selected at a time. After selecting the output target, click the "Ok" button to produce a listing of page summary on the target output device. If "Screen" is the selected option, output is directed to a text window on screen (see Figure 18). The header display window may be closed by selecting its "Close" option from the X-Windows unlabeled pull-down menu located in the upper left corner of the window border. The text window display contains output from the UNIX "vi" editor. It responds to all "vi" commands. If "Printer" is the selected option, a paper printout of the summary information is produced by the default printer. To ensure printout of full lines, the default printer should be capable of 136 character/line output. If "File" is the chosen option, the header information is written to a user specified file as defined in the dialog box that appears when the "File" option is selected. To close the "Page Summary" window, click the "Exit" button.

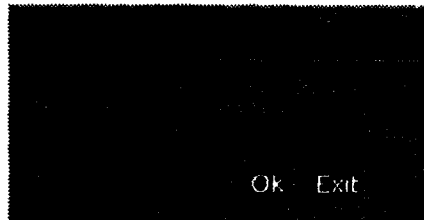


Figure 17. Page Summary Definition Window

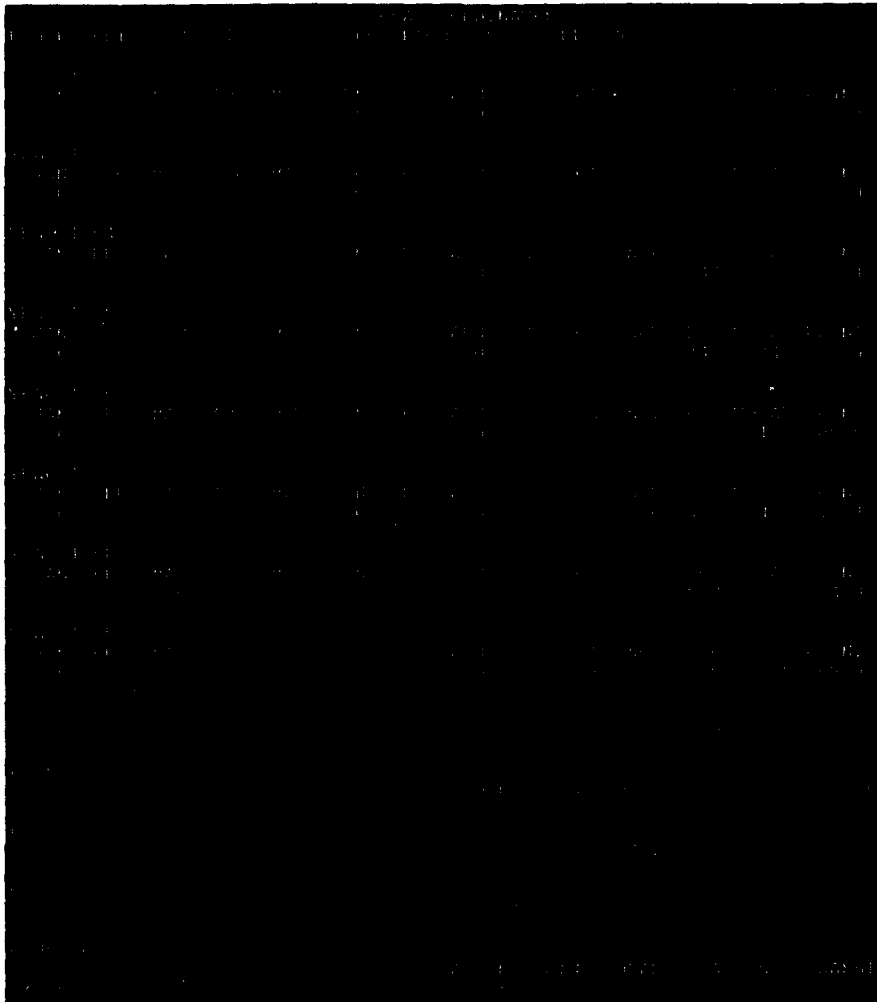


Figure 18. Page Summary Screen Output Example

3.3.4.4 UTIL

The "UTIL" pull-down menu currently provides options for users to initialize or save "Selection Status" settings from/to a file.

3.3.4.4.1 UTIL: Read Defaults File

When clicked, the "Read Defaults File" menu item opens a window (Figure 19) for entry of a filename. The named file must conform to the initialization (default) format described in Appendix C. When "Load" is clicked, values contained in the file replace existing values in the "Selection Status" area. If successful, the "REMARK" textbox will contain the message "New Defaults File Loaded". If unsuccessful, the "REMARK" textbox will respond with "Error reading Defaults: Clearing Defaults". To close the "Read Defaults File" window, click the "Exit" button.

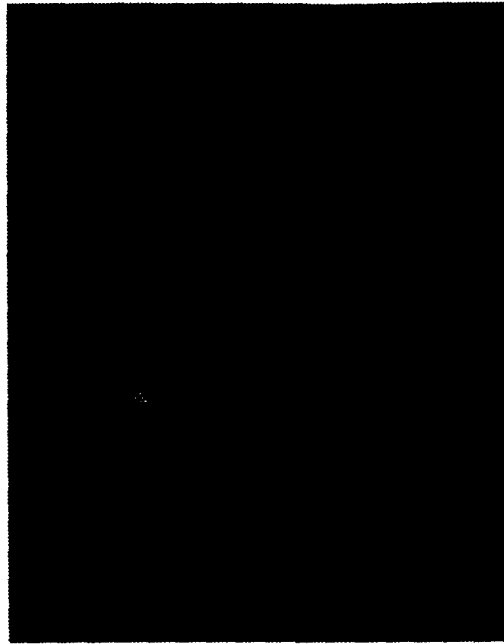


Figure 19. Util Read Defaults File Window

3.3.4.4.2 UTIL: Write Defaults File

When clicked, the "Write Defaults File" menu item opens a window (Figure 20) for entry of a filename. When "Ok" is clicked, the named file is created and the current values of "Selection Status" textboxes are written to the file in the initialization (default) file format described in Appendix C. This features permits users to save initialization parameter settings for reuse. If successful, the "REMARK" textbox will contain the message "Written To File". If unsuccessful, the "REMARK" textbox will inform of the reason for the failure.

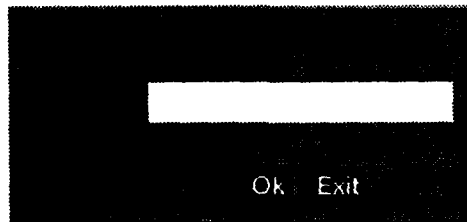


Figure 20. Util Write Defaults File Window

3.3.4.5 HELP

The "Help" pulldown menu offers on-line assistant to the user. Help is available on MOODS software procedures and techniques from the menu items that appear when the "Help" menu header is selected. Help on each subject is provided in a series of pop-up help screen windows that appear in response to menu item selection. When/if additional help is available, it may be accessed by clicking the "Help" button located in the lower right corner of a help screen. To close a help screen, click the "Ok" button, located in its lower left corner.

3.3.5 REMARKS

The buff-colored "Remark" textbox is located in the lower left corner of the display window. The "Remark" textbox provides notification of errors, event status and communicates instructions for follow-on interaction by the user.

3.4 Using the MOODS Data Management System

The previous subsection (3.3) of this manual describes the screen displays, windows, and the functional mechanics required to operate the MDMS. This subsection discusses operational use of the MDMS. MOODS is an exceptionally large database. To optimize performance, the database has been physically partitioned into 10 public (unclassified) geographical regions and 4 restricted geographical regions. Each regional domain contains the MOODS data for all years within that domain. Logically, the MDMS projects a seamless, integrated view of the MOODS database that hides the underlying physical structure.

3.4.1 MDMS Features

The MDMS is the user "front end" for the NAVOCEANO MOODS database. It enables access to the MOODS database by authorized users and supports the database management and control functions vested in the MDBA. The MDMS supports database queries, data ingestion and extraction, data visualization, user help and error reporting. For the MDBA, the MDMS supports maintenance of query criteria and historical records. Button labels for MDBA-only features are inactive when other users execute the MDMS.

3.4.1.1 Database Queries

Most MDMS features involve a database query as the initial process. Consequently, the opening MDMS display has been designed for interactive construction of database queries. MDMS queries are based on parameters contained in MOODS profile headers. The minimum and maximum values of 10 parameters must be initialized before the MDMS executes a database query; otherwise, an error message will be sent to the "Remarks" textbox by MDMS procedures that involve a database query. The 10 query parameters are displayed in the "Selection Status" section of the main MDMS display. Except for Latitude and Longitude, minimum and maximum query parameters may be set to the same value. Query parameters may be initialized manually or by reading a default file. A database query does not occur until the user selects an MDMS option that requires a search for data.

3.4.1.1.1 Manual Initialization of a Database Query

Latitude and Longitude limits are defined in the "REGION SELECTION" window which is accessed through the "Region" button of the "SELECT" pulldown menu. Time limits are defined in the "TIME SELECTION" window which is accessed through the "Time" button of the "SELECT" pulldown menu. The remaining 7 parameters are initialized by the "Data Selection" portion of the main display, as either a minimum or maximum value, in accordance with the status of the "Minimum" and "Maximum" toggle buttons in the "Selection Status" portion of the main display. Manual parameter initialization may be accomplished in any order. Existing values may be modified and remodified within the constraints of the "Data Selection" display.

3.4.1.1.2 Using Parameter Initialization Files

When the MDMS is launched by entering *moods* at the UNIX command line, the application automatically looks for the "moods.defaults" file in the current directory. There are two additional options for setting query parameters using parameter initialization files:

a. From the command line, enter *moods -f filename*. The flag "-f" tells the MDMS that the next argument ("filename") is the name of a file to use instead of "moods.defaults". The "-f" flag is the only flag currently implemented by the MDMS.

b. By entering the name of a parameter initialization file into the dialog box which appears when the "Read Defaults File" button is selected from the "UTIL" pulldown menu. This option allows the user to implement an alternate parameter initialization file from within the application, thereby obviating the need to exit from the MDMS to do so.

Parameter initialization files may be created by saving existing parameter values. This is accomplished by clicking the "Write Defaults File" button under the "UTIL" pull-down menu, entering the filename and clicking "Ok" to create the file.

3.4.1.2 Importing Data (MDBA Only)

The MOODS data import function is reserved for MDBA use only. A database query is not necessary for data import. It is important to note that repetitive import of the same data file produces duplicate data in the MOODS database. The existence of duplicate profiles in MOODS may require database cleanup by the MDBA using direct SQL commands to the Empress rdbms engine. The only criteria available for differentiating between duplicate MOODS profiles may be the unique loading date assigned to each profile when imported into the database. To be imported, data must be in the MOODS ADMIN format; otherwise an error will be reported. Importing data has no effect on parameter settings within the main MDMS display. Imported data is sorted by region before ingestion into the database.

3.4.1.3 Exporting Data

Within classification constraints, all users may extract MOODS data to a file. The data to be exported is determined by the parameter range settings in the "Selection Status" section of the main display. The database query occurs when the "Done" button is clicked after entering the output file name. All MOODS profiles with header information falling within the boundary criteria displayed in the "Selection Status" display will be written to the named file. Subsequent exports to the same file will overwrite any previous output; i.e., exported data is not appended to the file.

3.4.1.4 Updating Parameter Selection Tables (MDBA Only)

The MDBA may add, delete or modify classification codes, instrument types and source codes through the "Update Table" option of the "MDBA" pulldown menu. Numerical codes and descriptions are not preset by the MDMS. Each parameter (Class, Instrument ID and Source) is treated as a separate entity in the "Update Table" submenu; however, procedures are much the same for each. A deleted parameter value is immediately removed from the parameter listbox. When added, a new parameter value is initially appended to the listing; however, in subsequent accesses to the parameter update window, the new parameter value appears properly inserted within the listing. The numerical identification codes and the informative text associated with them may be edited as separate entities, even though each listbox line contains both the code and the text.

3.4.1.5 Viewing the Data Distribution

The "PRODUCTS" pulldown menu supports visual examination of MOODS data as a histogram plot, a geographical location plot, or a parameter versus depth (profile) plot. Each plot procedure requires a database query to establish the data content to be plotted.

3.4.1.5.1 Frequency (Histogram) Distribution Plot

The MOODS histogram provides an easily interpreted visual representation of the results of a MOODS database query. It is a 3-dimensional plot (see Figure 13), one of two options available in the "Distribution Plot" window which appears when the "PRODUCTS: Distribution" menu item is clicked. The base dimensions of the histogram plot are subdivided into a grid whose mesh distance is set by entering the "Latitude" and "Longitude" parameters in the "Distribution Plot" window. The vertical dimension represents the number of profiles found to lie within each cell of the grid. Histogram output may be sent to the screen or to a printer.

3.4.1.5.2 Geographical Distribution Plot

The MOODS geographical distribution plot displays the spatial distribution of profiles found by a MOODS database query. It is one of three options available in the "Distribution Plot" definition window which appears in response to clicking the "PRODUCTS: Distribution" menu item. In the geographical plot, each profile is represented by an instrument type symbol at the proper geographic location. The size of the symbol is determined in the "Distribution Plot" window. The latitude and longitude boundaries of the plot are those defined in the "Selection Status" portion of the main display. Grid coordinate distances are determined by the "Latitude" and "Longitude" parameters defined in the "Distribution Plot" window. Geographical distribution charts may be sent to the screen or to a printer.

3.4.1.5.3 Accumulation Distribution Plot

The accumulation plot is identical to the geographical distribution plot with the addition of a printed count of the number of profiles within each latitude/longitude box of the grid.

3.4.1.5.4 Depth Vs. Parameter Plots

The depth vs. parameter (profile) plot is a common method of displaying oceanographic data. The vertical plot axis is scaled for depth representation (meters) and the horizontal axis is scaled for units of the selected parameter. The MDMS provides the capability to construct depth vs. parameter plots of temperature, salinity and sound speed - the three primary parameters depicted in MOODS profile data. These plots are available by clicking the "Depth Vs Parm" menu item under the "PRODUCTS" menu and selecting either "Temperature", "Salinity", or "Sound Speed" as the parameter of choice. For each parameter, a window appears offering modifiable default values for x- and y-axis ranges and the maximum allowable number of profiles. When the "Ok" button is clicked, the database is queried. Then, a graphics window displays the plot as a group. There is usually considerable overlap among the plotted profiles. Profiles which do not conform to the behavior trend displayed by most of the profiles are easily recognized due to their errant traces.

3.4.1.6 Query Criteria Maintenance (MDBA only)

The MDBA is responsible for maintaining the accuracy of key parameters used in querying the MOODS database. Only the MDBA can exercise all MDMS features. The MDMS provides editing services for the MDBA that support changes to classification codes, instrument types and source codes. New values for these query parameters can be added, and, outdated values can be deleted or modified. These services are available through the "Update Table" menu item of the "MDBA" pull-down menu. Care must be taken in making query criteria decisions that could affect the accessibility of MOODS data. This is particularly important for the classification parameter which controls user access to the MOODS. It is conceivable, but not likely, that an error in criteria maintenance could produce data that cannot be queried.

3.4.1.7 Transaction History (MDBA only)

It is vital to maintain records of data transactions that affect the state of the MOODS database. The MDMS maintains a small, separate transaction logging database that records key information concerning actions performed on the database by all users. This feature equips the MDBA with a modest degree of investigative capability. The MDBA can focus queries to the log database on single MDMS functions, individual users or date ranges. The output can be sent to the screen, the printer or a file. The logging services are available to the MDBA from the "Print Log" menu item under the "Products" pull-down menu.

3.5 Example

This example demonstrates how to set up the opening display, read data from a file, write data to a file, and viewing data.

3.5.1 Setting Up the Opening Display

Getting Started:

1. At the system prompt, type "moods". The MOODS opening display screen will appear (Figure 1). All information is provided from the default window but if you prefer to edit continue with this example.

Setting Region and Time:

2. Click the "Select" pull-down menu header. Then, select the "Region" menu item. The region selection window (Figure 2) will appear. Either use the rubberband technique, select from the list of predefined regions, or edit the region coordinates from the keyboard. Close the window by clicking the "File" button, then the "Exit" button. The region modifications will appear in the "Selection Status" portion of the "Main Window" display.

3. Click the "Select" pull-down menu header. Then, select the "Time" menu item. The time selection window (Figure 3) will appear. Click the "Start" button to change the start (minimum) date and time. Click the "End" button to change the end (maximum) date and time. After desired changes have been made, click the "Exit" button. The time and date modifications will appear in the "Selection Status" portion of the "Main Window" display.

Setting Classification Codes, Cruise Identification Numbers, Load Dates, Instrument Types, Months, Number of Parameters, and Source Code:

4. Click the "Minimum" or "Maximum" button located on the "Selection Status" window.
5. Select one of the minimum (maximum) classification codes listed in the "Data Selection" window. If the desired code is not visible, use the scroll bar to examine the remaining classification codes. The modifications will appear in the "Selection Status" portion of the "Main Window" display.
6. Move the cursor to the textbox labeled "Cruise Id" and click the mouse button to activate it. From the keyboard, enter the minimum (maximum) value desired for the cruise identification number. The modifications will appear in the "Selection Status" portion of the "Main Window" display.
7. Move the cursor to the textbox labeled "Load Date" and click the mouse button to activate it. From the keyboard, enter the minimum (maximum) desired load date. The modifications will appear in the "Selection Status" portion of the "Main Window" display.
8. Select one of the minimum (maximum) instrument types from those listed in the listbox labeled "Instrument Type" in the "Data Selection" window. If the desired instrument type is not visible, use the scroll bar to examine the remaining instrument types. The modifications will appear in the "Selection Status" portion of the "Main Window" display.
9. A minimum (maximum) month may be determined during the time selection procedure in step 3, above. If time selection was skipped, the minimum (maximum) month may be selected from the textbox labelled "Month". If the desired month is not visible, use the scroll bar to examine the remaining months. Modifications to the month will appear in the "Selection Status" portion of the "Main Window" display.
10. To select the number of parameters, manipulate the sliding bar labelled "Number of Parameters". The number above the sliding bar will change as the sliding bar is moved, and the minimum (maximum) number of parameters will appear in the "Selection Status" portion of the "Main Window" display.
11. Select a minimum (maximum) source codes from those listed in the listbox labelled "Source Code". If the desired source code is not visible, use the scroll bar to examine the remaining choices. Modifications to minimum (maximum) source codes will appear in the "Selection Status" portion of the "Main Window" display.

The opening window is now set up.

3.5.2 Reading Defaults Data from a File

Follow these steps to read default data from a file.

1. Click the "Util" menu header.
2. Click the "Read Defaults File" menu item.

3. Enter the desired file name in the textbox from the keyboard. Then, click the "Load" and "Exit" buttons (in that order).

Or, continue with these steps:

4. Select a directory.
5. Select a file.
6. Click the "Load" and Exit" buttons (in that order).

3.5.3 Writing Defaults Data to a File

Follow these steps to write data to a file.

1. Click the "Util" menu header.
2. Click the "Write Defaults File" menu item.
3. Enter the desired file name.
4. Click "Ok".
5. Click "Exit".

4 ERROR MESSAGES

MOODS error messages are displayed in the "Remarks" textbox within the MOODS opening display window. Errors are reported when a selected dataset cannot be found within the MOODS database or when an attempt is made to perform an illegal procedural action.

5 NOTES

5.1 Glossary

See the glossary contained in Appendix A for definitions of key terms used in this document. Also, see definitions given in Section 1.3.3.

5.2 Abbreviations (acronyms)

See the listing of acronyms in Appendix B for definitions of all relevant acronyms.

5.3 System Considerations

The MDMS is intended for installation in and execution by Sun Microcomputers, Incorporated computing platforms. Installation is site specific and tailorable to the environment. Appendix F provides information specific to installation of the MDMS within the NAVOCEANO computing environment. The MDMS may be executed from an X-terminal; however, some graphical screens within the MDMS are memory intensive and will cause termination of the software if available X-terminal memory is exceeded.

5.3.1 System/Software Requirements

The MDMS is an integrated software system that requires the presence of both specific commercial off-the-shelf software and government-provided software. While the details of integrated software item requirements are provided in Appendix E, the following general comments apply:

(1) The MDMS was designed for execution under control of the UNIX operating system on Sun Microsystems hardware.

(2) The MDMS requires the presence of the X-Windows client-server environment.

(3) The Open Software Foundation's (OSF) Motif Toolkit (library) must be present and available in the execution environment.

(4) A runtime version of UNIRAS ag/X Toolmaster software must be installed on the system and available in the execution environment to support MDMS graphical display options.

(5) The Empress relational database engine must be installed on the system and available for execution as the vehicle for accessing data contained in the MDMS database.

(6) The Naval Environmental Operational Nowcast System (NEONS) must be installed as the functional database model and library of database access tools.

(7) Of interest to programmers, the software code for this version of the MDMS was compiled using C and Fortran compilers supplied by Sun Microsystems, Incorporated.

(8) The MDMS is an interactive application. It incorporates standard X-Windows mouse and keyboard functions. See Section 2 for references that explain X-Windows procedures and terminology in greater detail.

5.3.2 Directory Map

MDMS software executables have been designed to execute via the following directory paths:

MDMS: /u/a/moodsdba/moods/src
NEONS: /u/a/moodsdba/isdb.lltn
Empress: /usr/local/empress/v6.2
UNIRAS ag/X Toolmaster: /usr/local/uniras/6v3a/base
X-Windows (X11R5): /usr/local/X11R5p12
OSF Motif: /usr/lib

These paths must be defined in the individual user's login and/or shell scripts for execution upon logging into the system and modified if system configuration is changed.

5.3.3 Security

The MDMS neither supports nor restricts the overall classification of the computing environment; however, classification codes are contained in the header information of each profile. The MDBA controls access to MOODS data by authorizing classification code access to each user.

5.3.4 Installation Procedures

Appendix F describes procedures for installing the MDMS as an executable application within the NAVOCEANO computing environment.

Appendix A

Glossary of Terms

bathymetric Of or pertaining to the depth of the ocean.

ingestion The procedure whereby data is translated and transferred from an exterior format and placed within the MOODS database for access under control of the MDMS.

Julian The day of the year according to the Julian calendar which begins on January 1. A Julian date does not include a year as part of its simple format.

metadata Information about a dataset, either descriptive or definitive as to quantity, quality, quantity or format.

profile A sequential listing of parameters keyed to a reference structure. A bathymetric profile contains sequential depth/parameter groups.

zoom The graphical scaling process whereby a screen display item is expanded or decreased in size.

Appendix B

List of Acronyms

CAST - Center for Air Sea Technology
CDRL - Contract Data Requirements List
DiD - Data Item Description
DoD - Department of Defense
E - east
GUI - graphical user interface
Lat - latitude
Lon - longitude
max - maximum
MDBA - MOODS Database Administrator
MDMS - Moods Data Management System
min - minimum
MOODS - Master Oceanographic Observation Data Set
MSU - Mississippi State University
mwmrc - "Motif window manager", an X-Windows window manager
N - north
NAVOCEANO - Naval Oceanographic Office
NEONS - Naval Environmental Operational Nowcast System
OSF - Open Software Foundation
S - south
twmrc - "Tom's window manager", an X-Windows window manager
W - west

Appendix C

User Default File

Default values for parameters appearing within the "Selection Status" textboxes of the MDMS main display may be maintained in a user-created default file. The user may specify the file containing default values by including the "-f" flag, followed by the filename, when launching the MDMS (example: moods -f myfile). If the default file is not indicated on the command line, the MDMS will look for the file "moods.defaults" in the current directory. If the "moods.defaults" file cannot be located, parameter boxes within the "Selection Status" portion of the main display will be blank at startup. The format for a default file is as follows:

Latitude	21.3	30.0
Longitude	-121.0	-109.0
Date/Hour	19621207:6:0:0	19931008:12:0:0
Classification	1100010	1100010
Month	3	3
Parms	2	3
Cruise-Id	300	300
Instrument	25	25
source	4	4
load-date	19920616	19920616

The values contained in a default file are ordered in a top-to-bottom sequence according to their appearance within the "Selection Status" portion of the main display. The format is free form except that labels and numerical values must be separated by at least one space and each labeled line must end in a carriage return. For each labeled category, there are two numerical entries, a minimum and maximum value, on each line. The first numerical entry is the minimum value. The second numerical value is the maximum value.

Appendix D

Data Formats

The MOODS Admin Format:

```

681051 35.25 148.1719671219113500 21818 01100010 0 16 2 2 3
0 135 5938 0 256 0 109 19880824 0 19921211 0 7248
21818 31 116M21818 31 0 0 0 0
0 0 0 0 0 0 0 0
0. 40.00 10. 17.20 15. 17.10 35. 17.10 40. 17.00
55. 85.00 60. 16.90 70. 16.90 80. 16.70 85. 16.10
105. 130.00 115. 14.50 120. 14.40 125. 14.40 130. 14.20
135. 0.00 0. 0.00 0. 0.00 0. 0.00 0. 0.00
681026 35.10 146.4019641220 1000 30073 01100010 0 5 2 2 3
0 45 5796 0 256 0 24 19880824 0 19921211 0 7233
30073 31 28M30073 31 0 0 0 0
0 0 0 0 0 0 0 0
0. 45.00 25. 17.30 30. 17.40 40. 17.40 45. 17.30
681025 35.25 146.0519671219173000 21818 01100010 0 13 2 2 3
0 135 5783 0 256 0 110 19880824 0 19921211 0 7232
21818 31 117M21818 31 0 0 0 0
0 0 0 0 0 0 0 0
0. 70.00 50. 14.80 55. 14.70 65. 14.70 70. 14.80
75. 120.00 80. 14.70 110. 14.70 115. 14.60 120. 14.10
125. 0.00 130. 12.90 135. 12.70 125. 14.40 130. 14.20

```

The IDEAS Format:

```

32.67 131.90 19691202 20600 25 4 3
80710 1100010 50 68AV8 oAV a
*****
10. 17.80 -99.00 20. 17.70 -99.00 30. 17.70 -99.00 50. 17.70 -99.00
32.52 131.74 19691205 1200 25 4 3
80840 1100010 30 66T78 oT7 ~
*****
0. 17.60 34.44 10. 17.65 34.43 20. 17.83 34.43 30. 17.73 34.44
32.52 131.78 19691205 3000 25 6 3
80840 1100010 60 66T78 oT7 ~
*****
0. 17.75 34.50 10. 17.67 34.50 20. 17.94 34.49 30. 18.12 34.50
50. 16.99 34.44 60. 17.00 34.43 0. 0.00 0.00 0. 0.00 0.00
32.52 131.85 19691205 10000 25 7 3
80840 1100010 90 105T78 oT7 ~
*****
0. 17.60 34.46 10. 16.59 34.32 20. 16.94 34.46 30. 17.32 34.43
50. 16.50 34.44 75. 16.40 34.43 90. 15.74 34.45 0. 0.00 0.00
32.53 131.91 19691205 13000 25 9 3
80840 1100010 130 206T78 oT7 ~
*****
0. 18.30 34.52 10. 18.12 34.51 20. 18.43 34.50 30. 18.45 34.52
50. 18.32 34.48 75. 17.80 34.48 100. 16.07 34.50 125. 14.46 34.49
130. 14.15 34.49 0. 0.00 0.00 0. 0.00 0.00 0. 0.00 0.00
32.28 131.69 19691206 13000 25 6 3
80840 1100010 60 64T78 oT7 ~

```

0.	18.30	34.50	10.	18.21	34.52	20.	18.33	34.52	30.	18.10	34.50
50.	17.90	34.49	60.	18.00	34.48	0.	0.00	0.00	0.	0.00	0.00

Appendix E

Commercial and Non-Developmental Software (NEONS,. Empress, UNIRAS, X-Windows, OSF Motif)

MOODS has been developed to operate within a Sun Microsystems SparcStation model 10 computer hardware environment. The operating system is SUNOS version 4.1.3, including the resident SUN C compiler which was used to write the MOODS software code. Some minor elements of NEONS have been written in FORTRAN77 (Sun FORTRAN77 version 1.4). Graphics support is provided by UNIRAS ag/X Toolmaster version 6v3b. The RDBMS engine is Empress version 6.2. The windowing environment consists of X-Windows version X11 R5 and the OSF Motif widget set version 1.3.

Appendix F

MDMS Installation Instructions

Instructions for:

- 1) Setting up the user .cshrc file.
- 2) Installing the MDMS Database files.
- 3) Installing the NEONS software tree.
- 5) Installing the MDMS user application resource files.
- 6) Installing the MDMS user application software.

Files provided:

cshrc	-	An example user .cshrc file.
db.tar	-	Tar file of the MDMS database files.
isdb.tar	-	Tar file of the NEONS software.
import_db	-	The import script that installs the MDMS database tables.
Install	-	The Install script that makes and installs the NEONS software libraries and shells and executables.
app-defaults.tar	-	Tar file of the MDMS user application resource files.
mdms.tar	-	Tar file of the MDMS user application software.

SETUP ENVIRONMENT:

- * Set up a login account as 'mdba'.
- * Login as the mdba and execute umask 022.
- * Identify the directory path for Empress version 6.x (installed).
- * Identify the directory path for UNIRAS ag/X Toolmaster (installed).
- * Modified or overwrite the .cshrc with the cshrc file provided on tape.
- * Set the MSPATH environment variable within the .cshrc file to point to the location of Empress.

For example, suppose Empress was installed in /usr/empress:

```
change      setenv MSPATH ?/empress/v6.2
to          setenv MSPATH /usr/empress/v6.2
```

```
add $MSPATH/bin to path
set path = ($path $MSPATH/bin)
```

- * Create a database directory which will contain the MDMS database. Use empmkdb to create the MDMS database. Refer to the Empress "Database Administrator's Guide" for syntax.

Edit the tabzero file under the database directory, set the database permissions and privileges as required by your security environment.

For example, suppose your security environment is unclassified and wide open to the world. Setting the MSDBPERMS, MSDBDBAPRIVS and MSDBPRIVS Empress environment variables to the following will make your database public to the world:

```

MSDBPERMS = WR, WR, WR
MSDBAPERIVS = dba dba user grant;
              dba dba alter
MSDBPRIVS = dba dba all grant;
            dba public user

```

Refer to the Empress "Database Administrator's Guide" for assistance in customizing your database to meet your security needs.

Set the environment variable NEONS_DB within the .cshrc to point to this directory.

```

change      setenv NEONS_DB ?/neons_db
to          setenv NEONS_DB /mdms/db

```

Source the modified .cshrc file to update the MDMS environment.

Run the import_db script to install the MDMS database tables.

- * Create a directory to hold the NEONS software. Move the isdb.tar file to that directory. Extract the NEONS software tree from the isdb.tar file.

For example, suppose you wish to create a NEONS software directory within the existing directory path /mdms. Execute the following commands:

```

mkdir /mdms/isdb
mv isdb.tar /mdms/isdb/isdb.tar
change (cd) to the /mdms/isdb directory
tar xvf isdb.tar

```

Set the environment variable NEONS_SW within the .cshrc to point to this directory.

```

change      setenv NEONS_SW ?/isdb
to          setenv NEONS_SW /mdms/isdb

add         $NEONS_SW/bin to path
            set path = ($path $NEONS_SW/bin)

```

- * Source the modified .cshrc file to update the mdba environment. Run the Install script to make and install the NEONS libraries, shells and executables.

```

source ~mdba/.cshrc
Install

```

- * Run test examples under \$NEONS_SW/src/*_ex to check connectivity between the MDMS database and the NEONS library software routines. (optional)

- * Create an 'app-defaults' directory. Move the app-defaults.tar file to that directory. Extract the MDMS application resource files from the app-defaults.tar file.

For example, suppose you wish to create an app-defaults directory under the mdba home directory. Execute the following commands:

```
mkdir ~mdba/app-defaults
mv app-defaults.tar ~mdba/app-defaults
change (cd) to the ~mdba/app-defaults directory
tar xvf app-defaults.tar
```

Then, set the environment variable XAPPLRESDIR within the .cshrc to point to this directory.

```
change      setenv XAPPLRESDIR ~/app-defaults
to          setenv XAPPLRESDIR ~mdba/app-defaults
```

- * Create a MDMS application directory. Move the mdms.tar file to that directory. Extract the MDMS application software tree from the mdms.tar file.

For example, suppose you wish to create a MDMS application directory under /appl:

```
mkdir /appl/mdms
mv mdms.tar /appl/mdms/mdms.tar
change (cd) to the /appl/mdms directory
tar xvf mdms.tar
```

Then, make an executable of the MDMS application.

```
move (cd) to the /appl/mdms/src directory and execute the command
make.
```

Then, update the mdba .cshrc file to include the path to the MDMS executable.

```
add    /appl/mdms/src to the path
set path = ($path /appl/mdms/src)
```

- * Source the modified .cshrc file to update the mdba environment.

```
source ~mdba/.cshrc
```

MDMS INSTALLATION AND ENVIRONMENT SETUP SHOULD NOW BE COMPLETED - If all went well!

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